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80. *Recurvirostra americana* Gm.
 81. *Rallus virginianus* L. But once observed—May 20—in a marsh near town.
 82. *Grus canadensis* (L.). One recently shot was seen in market in South Pueblo.
 83. *Anas boschas* L. Abundant in April and September on the river.
 84. *Chaulelasmus streperus* (L.). One was shot out of a flock of five on May 15.
 85. *Querquedula discors* (L.). Common in May and September on the river.
 86. *Querquedula cyanoptera* (V.). Not uncommon in May on the river.
 87. *Nettion carolinensis* (Gm.). Common on the river in April and September.
 88. *Erismatura rubida* (Wils.). A male, the only one seen, was shot on a pond May 11.
 89. *Lophodytes cucullatus* (L.). Alderman Morse of Pueblo informs me that he shot one on the river here several years ago.
 90. *Mergus merganser americanus* (Cass.). Common in April on the river.
 91. *Pelecanus erythrorhynchus* Gm. Mr. Bagley of Rye, Pueblo Co., Col., has a bill of one in his possession which he shot on a large artificial lake near Pueblo in 1880.

A STUDY OF THE SINGING OF OUR BIRDS.

BY EUGENE P. BICKNELL.

(Continued from Vol. I, p. 332.)

Spizella monticola. TREE SPARROW.

THIS hardy Sparrow, though provided through our winters with an unfailing supply of seeds from the catkins of swamp alders and the dried flower-clusters of golden-rods and other withered weeds which reach above the snow,* seems nevertheless

* The number of wild plants and trees that keep their seed through the winter is greater than the casual observer would be likely to believe. During a recent winter I gave some attention to this subject, noting down all the trees and plants found with seed. No systematic or extended search was made, yet a few midwinter walks gave me a list of about one hundred and fifty names. Some of these were of scarce plants, or those the fruit of which was hardly adapted for a bird's food, but many were of common and widely-spread species, which were well suited to form winter staples for our granivorous birds.

early to become impatient for spring. It is always ready with song for the first mild, sunshiny days after the middle of February, and I have often heard its initial notes on or about the 22d of the month. Sometimes, however, it does not begin to sing until March, and in 1877, when this month was decidedly inclement, the first day of song was March 21. My latest record for song is April 13, but in some seasons it is not heard later than the end of March.

In the fall, singing is unusual, but I have several times heard songs in November, once so late as the 17th.

Isolated dates for singing are January 11, and December 12, 1880; on the latter occasion the song was feeble and imperfect, but on the former it was complete, and several times repeated.

Besides its customary *chip*, the Tree Sparrow has a low double note, which is uttered mainly while the birds are feeding. This simple and slightly musical sound from many birds busily feeding together produces a low conversational chirping, so pleasantly modulated as to seem like an unconscious expression of contented companionship.

Spizella domestica. CHIPPING SPARROW.

The familiar song of this domestic species we hear in almost every kind of weather, from the bird's arrival in early April on into the summer, usually with no evident falling off until towards the end of July. Then singing becomes less general with the species, and it may cease in the first week of August, though more often, perhaps, prolonged into the second week. My dates for final songs are from the 5th to the 15th, with a single record of the 18th.

Almost two months may now elapse before the song of the Chipping Sparrow is heard again; then singing is transiently resumed. This supplementary song-period occupies a few days only. I have never known it to last a full week in any one year, however abundant the birds might be. The greatest range in the dates of several years is from September 24 to October 10. The first songs of this latter period are sometimes imperfect.

Spizella pusilla. FIELD SPARROW.

This Sparrow also arrives in song, except, as with other birds, in the case of individuals of premature advent. Singing con-

tinues with some yearly regularity until the middle of August, at which time, or even a little before, it may cease; or the time of cessation may be delayed a week or ten days. Latest dates for singing are August 29 and 31. I have noticed no indication of singing in the autumn.

In several instances I have known the songs of early spring arrivals to be so aberrant as scarcely to be recognizable, and have noted similar but lesser variation in the songs of later comers. There is also considerable individual variation in the song, the normal song being sometimes prolonged into elaborate variations. Mr. J. A. Allen has written of this species, as observed in Florida (Bull. Mus. Comp. Zoöl., Vol. II, No. 3, p. 279), that "The songs of the males were so different from those of the northern bird that the species was almost unrecognizable by me from its notes." As illustrating further geographical variation in voice of this species, I may quote from a letter from Mr. Fred. T. Jencks of Providence, that "The Field Sparrow in Illinois usually twice repeats the song he gives in the East."

Junco hiemalis. SLATE-COLORED JUNCO.

Early March is most often the time when we first hear the song of this Sparrow; but, according to the character of the season, the beginning of singing may vary within two weeks in either direction from the average time. After the early days of April, singing is not commonly heard, and in some years it ceases before the end of March. April 17 is my latest record, although the species often remains into May. The Junco has two very different songs: a simple trill, somewhat similar to that of the Chipping Sparrow; and a faint whispering warble, usually much broken but not without sweetness, and sometimes continuing intermittently for many minutes. It seems to slip very readily from a simple chirping, and is always the song with which the species begins the season. Later, the first mentioned becomes the more general if not the only song, as I found it to be in the Catskill Mountains in summer, when the birds were breeding.

The Snowbird does not often sing in the autumn, but I have heard both of its songs in October and November; and it

seems always ready with a few feeble song-notes for any day that comes out sunshiny and mild in sudden change from harder weather.

Melospiza fasciata. SONG SPARROW.

This familiar Sparrow sings with greater constancy through the seasons, and with less regard to adverse weather, than any other of our song-birds. All through the hottest summer weather it is songful, though the oppressive days of late August seem sorely to try its spirit; but it recovers its cheerfulness with advancing autumn, and is one of the few birds which, in that season, repeats its full chorus of the spring. In every month of winter, too, I have heard its song. Not that it sings uninterruptedly throughout the year; for there is an intermission of singing between November and February. But the general rule of silence for these two months is not infrequently transgressed. Its song is one of the first which the waking season brings; though it is usually a little antedated by that of the Bluebird. Like the latter, the Song Sparrows are often in advance of the season, and early in the spring I have found them singing cheerily when the temperature was but little above zero (F.), and even when snow was falling thickly.

The earliest songs of which I have record date January 25 and 27. Ordinarily first songs are not until the middle of February, though it is not unusual to hear them after the first week of the month. In severe seasons they may be deferred until its latter days; but I have never known silence to be kept longer, however inclement the weather. But universal singing with this species does not always proceed directly from the first song; here the weather has much influence. Thus, in the year 1879, the first song was on February 7, but up to the end of the month singing was intermittent and timorous only, and the confident spring song was not voiced until March 5. But when singing has become general, only the most adverse weather can reduce the joyous birds to silence. When the first songs are not until late in February, the impulse to sing is likely to become pretty general in a single week. The earliest songs are sometimes nothing more than feeble warblings without definite beginning or ending, but with favorable weather they quickly pass into the full-voiced aria of spring.

Singing continues through the summer. In some years, chiefly in seasons of drought, it falters under the heats of late July; yet, even at these times, the steadfast little chanters never seem to be wholly discouraged. Through a great part of August they continue in voice; but later singing slackens, and towards the end of the month complete silence is averted only by occasional weak songs.

In August, a change comes over the songs of many of the birds. Their songs lapse into a low, desultory warbling, even more indeterminate than their first attempts in late winter, as if they had lost their early interest or lacked the power to sustain the full pitch of their notes. But it is probable that in the summer time a state of complete silence is never quite reached, though it is much more nearly approached in some years than in others. During these times of uncertain singing the low warble is the more usual song, and sometimes wholly replaces the louder one; but the latter may occur at any season. Sometimes, chiefly in the autumn, the undertoned song is remarkably prolonged, the notes being thrown together with much modulation, but without definite arrangement. In this manner singing may be continued without pause for more than a minute.

From the latter part of September to the middle of October the full song is resumed and, associated with the inferior song, is continued into November. On fine bright October and early November days, the song is sometimes as frequent and given with as much ardor as in the spring. After the first week of November singing is not longer to be depended upon, but fine weather may call it forth up to the end of the month.

Among the various notes of the Song Sparrow are two very different *chirps*, one being particularly characteristic of the species, and a peculiar low chippering. The latter seems to be uttered only in the mating season. In advanced seasons I have heard it at the end of February.

Earlier in this paper I alluded to the wide individual variation in the song of this Sparrow. While scarcely any two of the birds sing just alike, occasionally songs are heard which it is hard to believe are from this species until optical evidence forces conviction. I recall a particular instance of this kind which came under my observation at Sing Sing, N. Y., while in the company of Dr. A. K. Fisher. We were attracted by a song

which was perplexing to us both. It clearly suggested the song of the little Field Sparrow (*Spizella pusilla*), but the locality was not one which that bird would be likely to frequent. With much interest we approached the singer, half expecting to note the occurrence of a rare species. The author of our excitement was a Song Sparrow, evidently wholly unconscious that it was not singing after the manner of its fellows.

Melospiza palustris. SWAMP SPARROW.

Although a simple, unpretentious trill in April, from some wet meadow, bog, or reedy marsh, always first tells me of the presence of the Swamp Sparrow, it cannot be said that the bird arrives in song; for the nature of the places it inhabits, with its retiring disposition, might well keep the secret of its presence until it chooses to make itself known. It is probable, however, that, like most birds, it comes to us in song. Dates of first songs extend from April 4 to 24, but most often fall after the middle of the month.

Early April songs are exceptional, and not improbably are from birds which have remained over winter; as in several seasons after such early songs it has been a week or two before the species was heard again.

The song of the Swamp Sparrow comes up from the swamps and marshes until early August, then it becomes less frequent. Usually it ceases about the middle of the month, sometimes a little before, but not unfrequently it continues later, and I have heard songs even so late as early September. About a month of silence now ensues; then the species comes again into voice. My record gives dates for the recommencement of singing from September 11 (?) and 18, to 28. The time of final cessation is carried into October—15th and 17th are latest dates; but often the song is not heard after the first part of the month. In this supplementary season of song, singing is by no means general, and is usually confined to the early morning hours. But the birds seem more ambitious in their vocalism than earlier in the year. In the spring and summer the song is a simple monotone; in the autumn this is often varied, and extended with accessory notes. A few preliminary *chips*, merging into a fine trill, introduce the run of notes which con-

stitutes the usual song, which now terminates with a few slower somewhat liquid tones. This seems to be the fullest attainment of the bird, and is often only partially or imperfectly rendered.

***Passerella iliaca.* FOX-COLORED SPARROW.**

This fine Sparrow, "the noblest Roman of them all," sings for us both in the spring and in the autumn. My records are comprised between the following dates: February 29 and April 13 in the spring; and October 28 and November 17 in the fall. At neither season are they in song when they first come, unless possibly in a spring when the arrival is late; if they come exceptionally early, singing may be considerably postponed.

In the fall they are sometimes in voice soon after making their appearance; but it is usual for them to be present some time before their mellow notes add their charm to the late autumn. Singing often lasts as late as the second week of November, but rarely later, even though small flocks of the birds remain till the end of the month.

Like many other birds this Sparrow seems indisposed to sing unless present in some numbers, and in seasons when it is uncommon, whether spring or fall, its song may not be heard.

***Pipilo erythrophthalmus.* CHEWINK.**

The Towee Bunting, though it joins the bird community promptly at the first good chance after the middle of April, is sometimes a little tardy in joining the choir; and, if it meets with discouraging weather, is satisfied for a time with simply announcing itself by name. Later its short and energetic song becomes a striking feature of the bird chorus about the hedgerows, and bushy borders of woods, fields and swamps.

Singing becomes decadent towards the end of July, or early in August, and closes at any time from the first to the middle of the month—August 4-18, 20, 22. There is no well-defined second song-period, but I have heard its song several times in September, and once in October (October 7, 1881), when it was several times repeated.

In late summer, after singing has ceased, the *chewink* notes become weak and infrequent, and may be wholly intermitted for

a time, but they are resumed in their usual vehemence before the species departs.

Cardinalis virginianus. CARDINAL GROSBEEK.

This bird is of irregular occurrence, but I have heard it in full song in every month from April to August inclusive. I have also seen it in every month from October to February, but through this time its only utterance was a fine sharp *chip* or *click*.

At this northernmost limit of its habitat its voice is certainly not less loud and forcible than in the South. Before I was familiar with its notes I was startled from sleep early one July morning by a violent whistling. It sounded so nervously hurried and intentionally loud that, in my sudden awakening, I thought it an alarm intended to arouse me. A moment later could have been seen at the window a figure *en déshabillé*, and on a near grape-vine trellis a Cardinal Grosbeak in the rôle of a fiery-coated alarmist.

Zamelodia ludoviciana. ROSE-BREASTED GROSBEEK.

The few Rose-breasted Grosbeaks which summer in the section of country covered by my observations sing well into the dog-days. I have heard them till the middle of August.

In the autumn the adult male seems to be uncommon, and I have never heard its song at that season; but on September 23, 1879, I shot a young male with crimsoning breast, which was in full song.

Passerina cyanea. INDIGO-BIRD.

The Indigo-bird sings faithfully through the midsummer; but the silencing influence that begins to overtake the birds at this time, reaches it about the end of July, and it is soon quieted. The last days of singing are between the end of July and mid-August; my records giving August 15 and 16 as dates of latest songs.

I have ever found this bird uncommon in the fall, and my scant data respecting its singing in that season are comprehended between the last two weeks of September.

The song-flight of the Indigo-bird I have but once witnessed—on September 23, 1879.

Regarding the singing of the Indigo-bird, Mr. Fred. T. Jencks, of Providence, writes me that he is able to distinguish by their songs the younger from the fully adult birds at a distance of at least one hundred and fifty yards. The songs of younger birds are more simple and less musical than those of adults. I am myself familiar with differences in the songs of Indigo-birds such as Mr. Jencks describes, but never traced them to their cause.

***Dolichonyx oryzivorus.* BOBOLINK.**

During its half-year visit the Bobolink sings only in May, June and part of July. Through the remainder of its stay, it has only a single short note. This is of a softly metallic tone, and in late summer and early fall is showered down over the country, and sometimes over the city, and at night, by flocks of the birds passing on their southward way. It is also a characteristic bird-note of the late summer, about wide weedy meadows, where tall *Compositæ* and other rankly growing plants uphold a rich harvest of seeds.

The song of the Bobolink is one of the first to drop out of the bird-chorus. I have not often heard it in July, and never later than the middle of the month; though where the bird is more common in the breeding season than with me singing doubtless continues later.

***Molothrus pecoris.* COWBIRD.**

The song-utterance of this species, although giving a slight reminder of its near relationship to the Blackbirds, is nevertheless strikingly unique. It has an indefinite beginning, which is continued into a high attenuated note, ending with a sound curiously like that of bubbling water. This irresistibly suggests a bubble-like bursting forth of sound after a long audible inhalation. It seems to be a sort of appendage to the ordinary song-notes, and is, perhaps, achieved only by vigorous individuals, or under the stimulus of courtship. Its production appears to be a matter of some difficulty, being attended by singular bodily contortions and a spreading and stiffening of the wings and tail.

The ardent male usually arranges to have these antics witnessed by two or more of the plainer sex, as we are forced to speak of the females of most birds, and we cannot doubt their efficacy in captivating the objects of his ambitious passion. But as the breeding season wears on, and the novelty of being many-wived has, perhaps, come to be a matter of some concern with this polygamist, its enthusiasm diminishes, and many songs fail at the terminal note of ebullition. Songs of this character are referred to beyond as half-songs.

Cowbirds are somewhat uncertain and capricious in the use of their voices, and show much variability in different years in the continuousness of song. As a general thing singing is infrequent in June, although extending through this month and into July. At this time the half-song is almost exclusively in use, but the bubble notes may be produced as long as the bird remains in voice. Dates of latest songs of the first period range from July 6 to 23.

There seems to be no regularity about singing in the fall; but I have heard imperfect notes and half-songs at different times within a month after the middle of September. Sometimes, in the autumn, when Cowbirds are assembled in small flocks, they become garrulous, when their commingled utterance of low notes produces a sound as of subdued warbling.

On October 8, 1882, I observed the male of a pair of Cowbirds striving, and with some success, to produce before its mate its full spring song, not forgetting the associated bodily contortions. Such behavior, in an autumn bird, was at least highly unseasonable, if not suggestive of illegitimate intentions.

The singular bodily action which accompanies the vocal expression of the Cowbird conveys the suggestion that the air-sacs of the body are brought into play in the production of song. The ducking of its head, the spasmodic motion of its tail, the half-opening of its wings, the swelling of its body, which collapses with the culminating notes; all this, seems to point to the utilization of the air-sacs—to their inflation and the muscular expulsion of the contained air—in the execution of its singular vocal performance. Indeed, from the peculiar bodily action of many birds while in song, it is reasonable to suppose that the air-sacs are often important adjuncts of the lungs and vocal organs. Such bodily motions during singing, and the special

muscular acts which, in many birds, are synchronous with the utterance of certain notes, may thus be motions which are necessary to the special operation of the air-sacs.

And if this be true it affords an explanation of the fact that the song of many birds is often more varied and prolonged in flight than when they are at rest, and that the highest vocal expression of some birds, as the Oven-bird, the Maryland Yellow-throat, and the Yellow-breasted Chat, for examples, is achieved only when the birds are on the wing.

The surprising length of time for which singing is often sustained argues greater resources of air supply than the mere capacity of the lungs, and here again we may have recourse to a special operation of the pneumatic system.

We have already seen that birds in general are most voiceful when having least fat; if the growth of fat on the body reduces the capacity of any of the air-sacs a reason for this is evident.

(*To be continued.*)

NOTES ON THE BIRDS OF THE NEARER ISLANDS, ALASKA.

BY LUCIEN M. TURNER.

THE localities here included embrace the islands of Attoo, Agattoo, and Semechi, with their outlying islets. The geographical position of the group lies between $185^{\circ} 30'$ and $187^{\circ} 30'$ W. of Greenwich. The parallel of 52° N. passes near their center. The group forms the westernmost portion of the Aleutian chain of islands, and, taken collectively, is known as the Bleezhnee or Nearer Islands, being so designated by the earlier explorers because they lie nearest to the Asiatic coast.

Semechi is the smallest of the three, and lies about twenty-three miles to the southeast of Attoo. It is quite low on the southern side, where are found innumerable ponds and lakes, some of the latter being of considerable area. The low-grounds are covered with vegetation of various kinds, and the shallower ponds, in some instances, yield vegetable food in abundance for the great numbers